

Application No. 10/823,311
Docket No. UC0423USNA

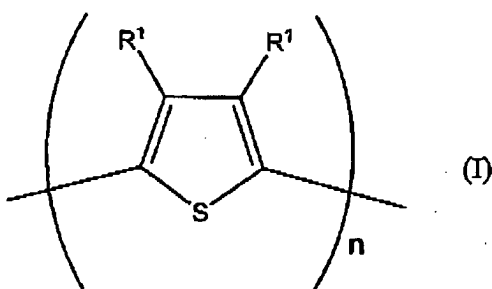
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Listing of Claims

1. (Currently Amended) An electronic device comprising an anode, a buffer layer, and an active organic material layer, wherein the buffer layer is a ~~A~~ composite comprising a first layer comprising at least one doped conductive polymer and a second layer comprising a material selected from a colloid-forming polymeric acid, a salt of a colloid-forming polymeric acid, a non-polymeric fluorinated organic acid, and a salt of a non-polymeric fluorinated organic acid, wherein the composition of the first layer and the second layer is different.

2. (Currently Amended) ~~A composite~~ An electronic device according to Claim 1, wherein the conductive polymer is selected from polythiophenes, polypyrroles, polyanilines, and combinations thereof.

3. (Currently Amended) ~~A composite~~ An electronic device according to Claim 2, wherein the polythiophene comprises Formula I:



wherein:

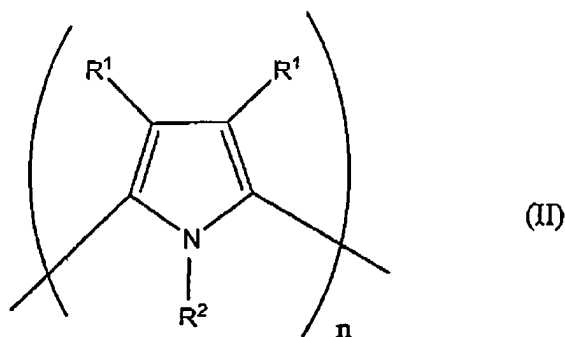
R^1 is independently selected so as to be the same or different at each occurrence and is selected from hydrogen, alkyl, alkenyl, alkoxy, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylaryl, arylalkyl, amino, alkylamino, dialkylamino, aryl, alkylsulfinyl, alkoxyalkyl, alkylsulfonyl, arylthio, arylsulfinyl, alkoxycarbonyl, arylsulfonyl, acrylic acid, phosphoric acid, phosphonic acid, halogen, nitro, cyano, hydroxyl, epoxy, silane, siloxane, alcohol, benzyl, carboxylate, ether, ether carboxylate, ether sulfonate, and urethane; or both R^1 groups together may form an alkylene or alkenylene chain completing a 3, 4, 5, 6, or 7-membered aromatic or alicyclic ring, which ring may optionally include one or more divalent nitrogen, sulfur or oxygen atoms, and

n is at least about 4.

4. (Currently Amended) ~~A composite~~ An electronic device according to Claim 2, wherein the polypyrrole comprises Formula II:

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wherein:

n is at least about 4;

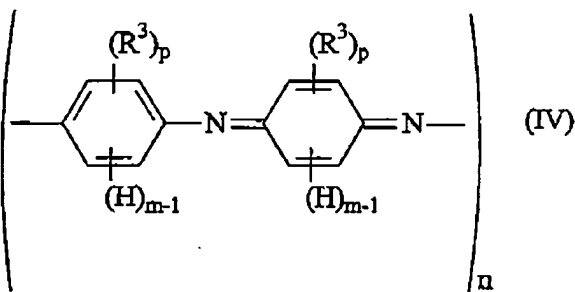
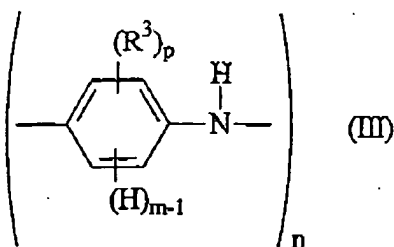
R^1 is independently selected so as to be the same or different at each occurrence and is selected from hydrogen, alkyl, alkenyl, alkoxy, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylaryl, arylalkyl, amino, alkylamino, dialkylamino, aryl, alkylsulfinyl, alkoxyalkyl, alkylsulfonyl, arylthio, arylsulfinyl, alkoxy carbonyl, arylsulfonyl, acrylic acid, phosphoric acid, phosphonic acid, halogen, nitro, cyano, hydroxyl, epoxy, silane, siloxane, alcohol, benzyl, carboxylate, ether, ether carboxylate, ether sulfonate, and urethane; or both R^1 groups together may form an alkylene or alkenylene chain completing a 3, 4, 5, 6, or 7-membered aromatic or alicyclic ring, which ring may optionally include one or more divalent nitrogen, sulfur or oxygen atoms; and

R^2 is independently selected so as to be the same or different at each occurrence and is selected from hydrogen, alkyl, alkenyl, aryl, alkanoyl, alkylthioalkyl, alkylaryl, arylalkyl, amino, epoxy, silane, siloxane, alcohol, benzyl, carboxylate, ether, ether carboxylate, ether sulfonate, and urethane.

5. (Currently Amended) ~~A composite~~ An electronic device according to Claim 2, wherein the polyaniline comprises Formula III or Formula IV:

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wherein:

n is at least about 4;

p is an integer from 0 to 4;

m is an integer from 1 to 5, with the proviso that $p + m = 5$; and

R^3 is independently selected so as to be the same or different at each occurrence and is selected from alkyl, alkenyl, alkoxy, cycloalkyl, cycloalkenyl, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylaryl, arylalkyl, amino, alkylamino, dialkylamino, aryl, alkylsulfinyl, alkoxyalkyl, alkylsulfonyl, arylthio, arylsulfinyl, alkoxycarbonyl, arylsulfonyl, carboxylic acid, halogen, cyano, or alkyl substituted with one or more of sulfonic acid, carboxylic acid, halo, nitro, cyano or epoxy moieties; or any two R^3 groups together may form an alkylene or alkenylene chain completing a 3, 4, 5, 6, or 7-membered aromatic or alicyclic ring, which ring may optionally include one or more divalent nitrogen, sulfur or oxygen atoms.

6. (Currently Amended) ~~A composite~~ An electronic device according to Claim 1, wherein said colloid-forming polymeric acid is selected from polymeric sulfonic acids, polymeric phosphoric acids, polymeric phosphonic acids, polymeric carboxylic acids, polymeric acrylic acids, and mixtures thereof.

7. (Currently Amended) ~~A composite~~ An electronic device according to Claim 6, wherein said colloid-forming polymeric acid comprises a fluorinated polymeric sulfonic acid.

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8. (Currently Amended) ~~A composite~~An electronic device according to Claim 7, wherein said polymeric sulfonic acid is perfluorinated.

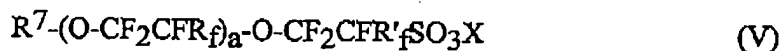
9. (Currently Amended) ~~A composite~~An electronic device according to Claim 1, wherein said non-polymeric fluorinated organic acid is selected from non-polymeric fluorinated sulfonic acids, non-polymeric fluorinated phosphoric acids, non-polymeric fluorinated phosphonic acids, non-polymeric fluorinated carboxylic acids, non-polymeric fluorinated acrylic acids, and mixtures thereof.

10. (Currently Amended) ~~A composite~~An electronic device according to Claim 1, wherein said non-polymeric fluorinated organic acid is selected from fluoroamido organic acids, fluoroamidoether organic acids, fluoroether organic acids, and combinations thereof.

11. (Currently Amended) ~~A composite~~An electronic device according to Claim 9, wherein said non-polymeric fluorinated organic acid is highly fluorinated.

12. (Currently Amended) ~~A composite~~An electronic device according to Claim 9, wherein said non-polymeric organic acid is perfluorinated.

13. (Withdrawn) A composite according to Claim 9, wherein said second layer comprises a fluoroether sulfonate having Formula V:



wherein R^7 is a fluoroalkyl group, R_f and R'_f are independently selected from F, Cl or a perfluorinated alkyl group having 1 to 10 carbon atoms, $a = 0, 1$ or 2 , and X is selected from H^+ , metal cations, and $N(R_1)(R_2)(R_3)(R_4)^+$ where R_1, R_2, R_3 , and R_4 are the same or different and are selected from H and alkyl.

14. (Withdrawn) A composite according to Claim 13, wherein R^7 is selected from difluoromethyl and 1,1,2,2-tetrafluoroethyl.

15. (Withdrawn) A composite according to Claim 13, wherein the second layer comprises a material selected from a non-polymeric fluorosulfonic acid and a salt of the fluorosulfonic acid, wherein the fluorosulfonic acid is selected from 2-(1,1,2,3,3,3-hexafluoro-1-(perfluoroethoxy)propane-2-yloxy)-1,1,2,2-tetrafluoroethanesulfonic acid, 1,1,2,2-tetrafluoro-2-(perfluoroethoxy)ethanesulfonic acid, and 2-(1,1,2,2-tetrafluoroethoxy)-1,1,2,2-tetrafluoroethanesulfonic acid.

16. (Canceled)

17. (Canceled)

18. (Currently Amended) A device according to Claim 161, wherein the device is selected from a photosensor, photoswitch, light-emitting diode, light-emitting diode display, photodetector, phototransistor, photoconductor, phototube, Infra-Red detector, diode laser,

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electrochromic device, electromagnetic shielding device, solid electrolyte capacitors, energy storage device, field effect resistance device, memory storage device, biosensor, photoconductive cell, photovoltaic device, solar cell, memory storage, antistatic film, electrochromic, solid electrolyte capacitors, energy storage, electromagnetic shield and diode.

19. (Withdrawn) A thin film field effect transistor comprising at least one electrode comprising the composition of Claim 1.

20. (Currently Amended) ~~A composite~~ An electronic device according to Claim 1, wherein at least a portion of the first layer is in physical contact with at least a portion of the second layer.

21. (Currently Amended) ~~A composite~~ An electronic device according to Claim 1, wherein at least one additional layer is interposed between the first layer and the second layer.

22. (New) An organic light-emitting diode comprising an anode, a buffer layer, an electroluminescent layer, and a cathode, wherein the buffer layer is a composite comprising a first layer comprising at least one doped conductive polymer and a second layer comprising a material selected from a colloid-forming polymeric acid, a salt of a colloid-forming polymeric acid, a non-polymeric fluorinated organic acid, and a salt of a non-polymeric fluorinated organic acid, wherein the composition of the first layer and the second layer is different.